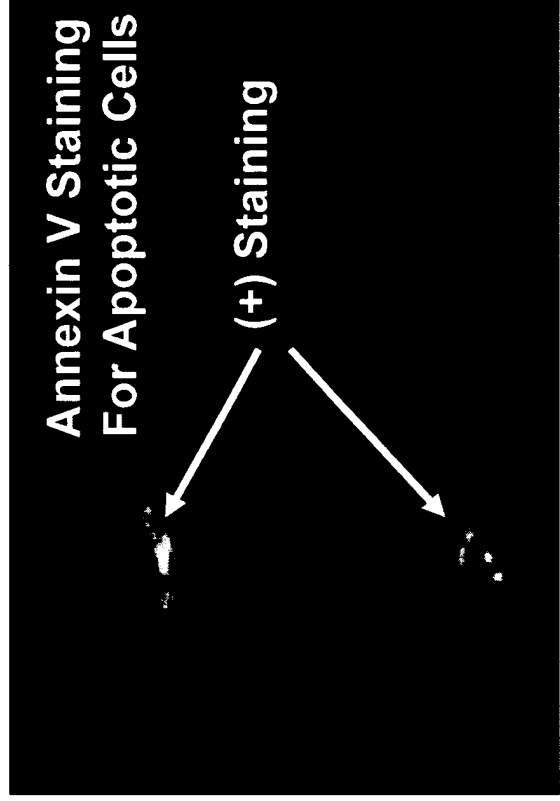
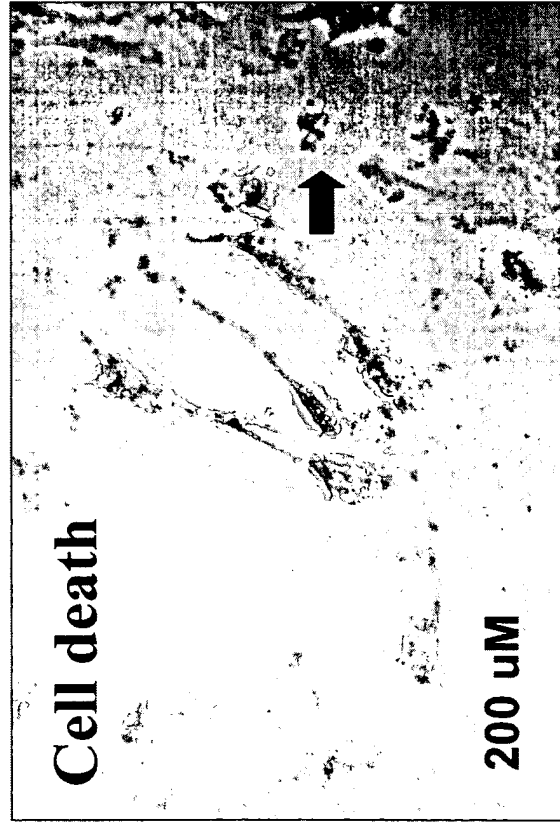
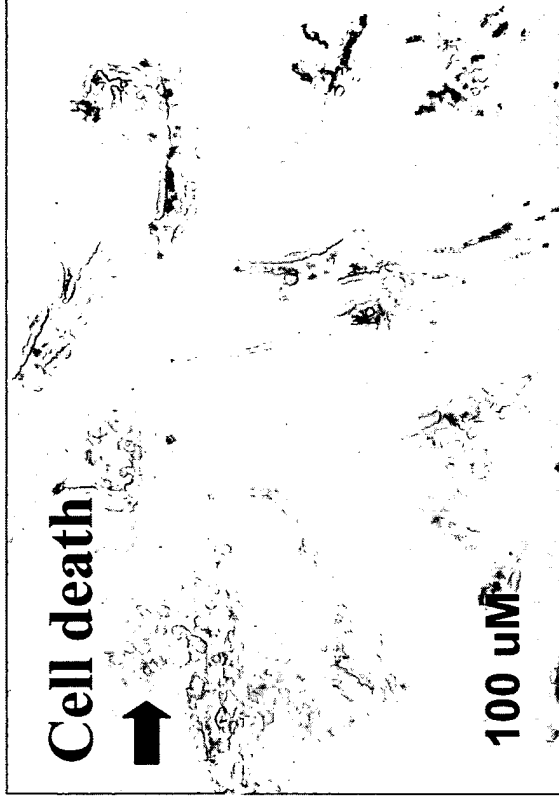
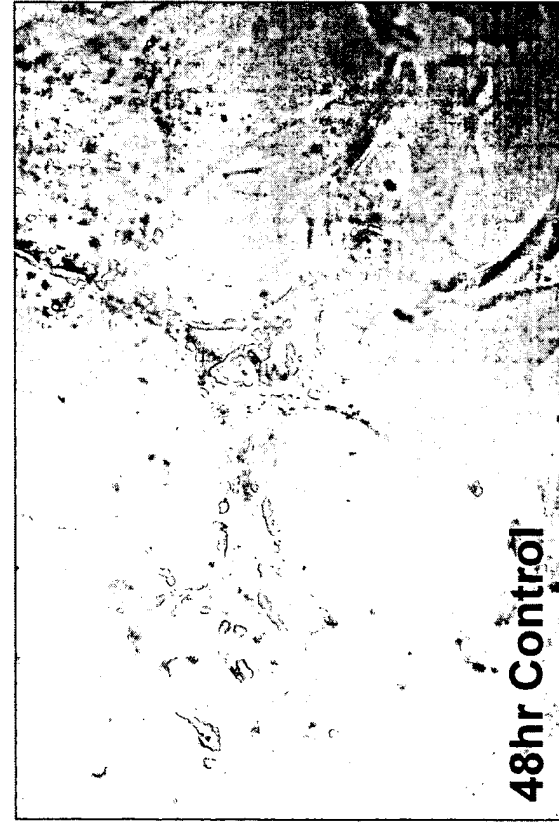


(1) Prevention of recurrence by inducing apoptosis of osteoclasts & tumor cells

(2) Bone graft protection with Bisphosphonate

**Figure 1.** A schematic diagram for therapeutic rationale using bone grafts coated with Bisphosphonate solution. Bone tumors induce osteoclast (tumor giant cells) formation. Osteoclasts destroy bone. Bisphosphonate-Bone Graft composite ( ) can induce apoptosis in giant cell tumors (GCT) & other tumor cells, prevent recurrence and protect bone graft resorption.



**Figure 2.** Pamidronate induces apoptosis of tumor cells of giant cells in a dose dependent manner. The control picture shows plumpy, polyhedral cytoplasm. Addition of 100 & 200 uM of Pamidronate induces cell death. Annexin V staining indicates apoptosis of tumor cells.

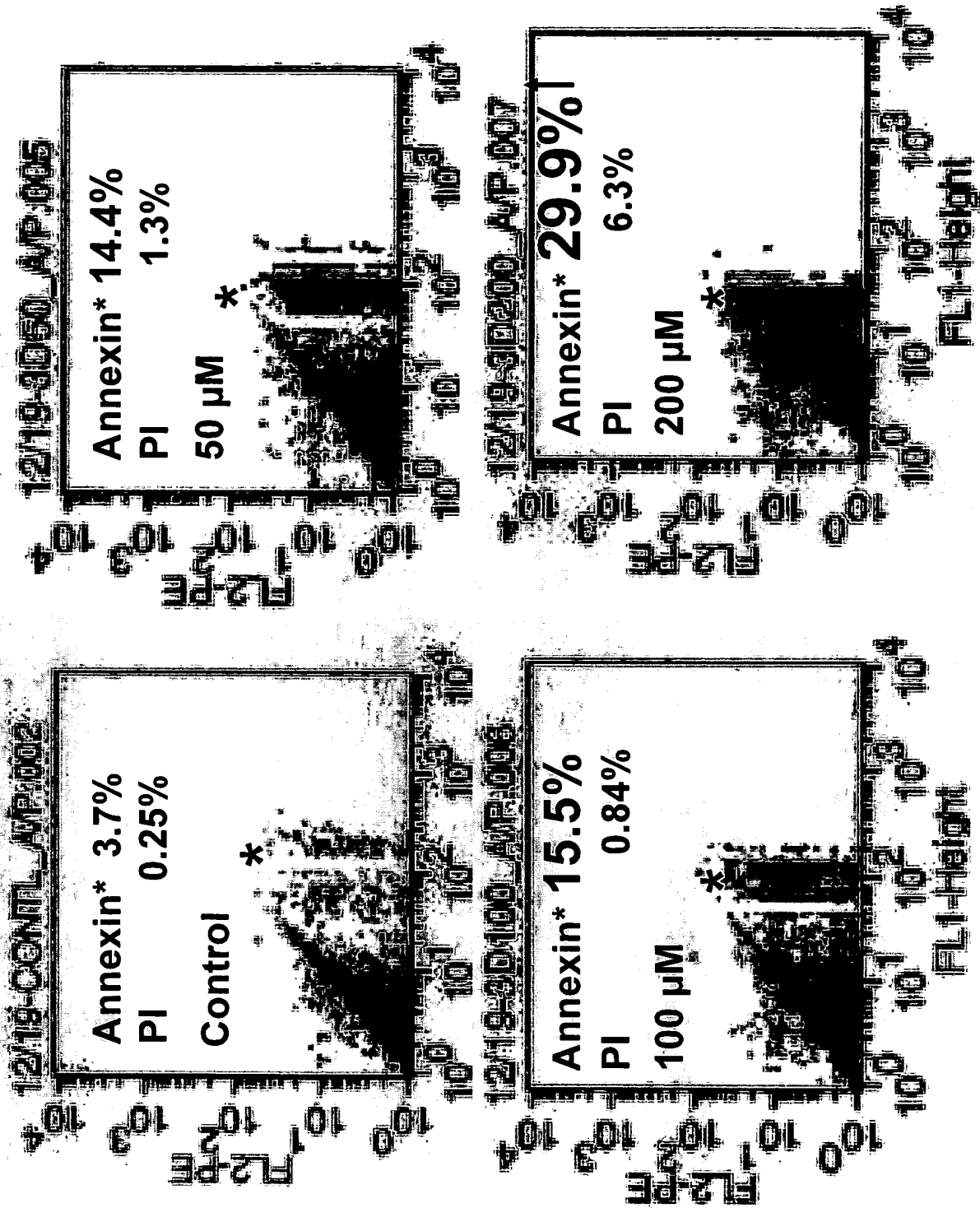
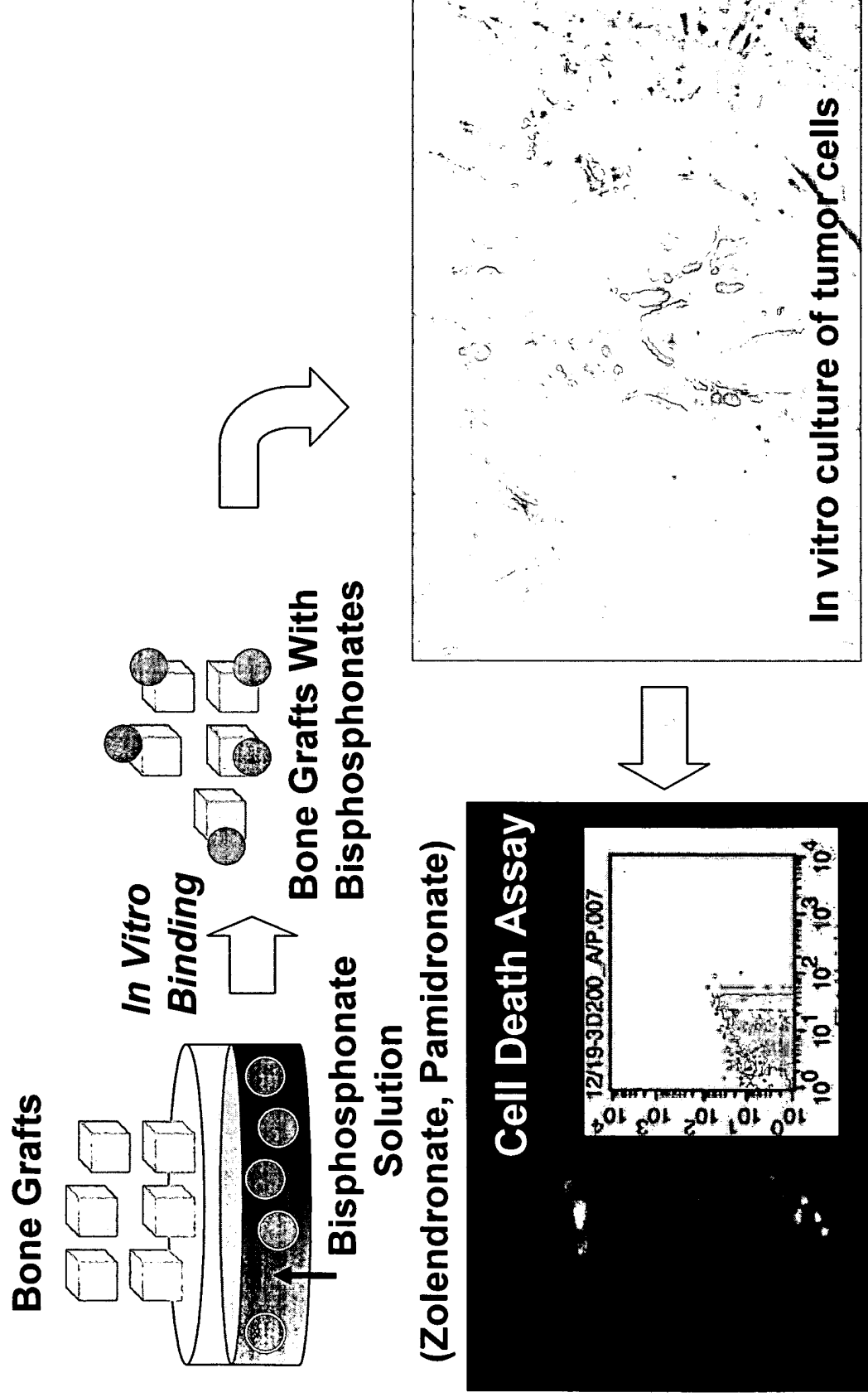


Figure 3



**Figure 4.** The effect of Bisphosphonate-Bone Graft Composite on the Giant Cell Tumor and Unicameral Bone Cyst in vitro